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GENERAL COMMENTS		
1	Acceptable Risk Levels as ARARs. Although the USACE acknowledges that DEQ ARARs apply, the report concluded that DEQ's statute and rule definitions of risk are not considered ARARs. On all other federal sites in the state, EPA considers Oregon statute and rule definitions of acceptable risk to be ARARs. Incorporating DEQ's acceptable risk limits as an ARAR will change some decisions about remediation needs at areas of potential concern (AOPCs). Without consideration of state definitions of acceptable risk as an ARAR, DEQ will not support the feasibility study for the Bradford Island site. DEQ commented on ARARs during review of the baseline human health and ecological risk assessment. An additional comment was that TPH is a hazardous substance in Oregon, and therefore needs to be evaluated in the risk assessment and feasibility study despite the petroleum exclusion in CERCLA. DEQ may have additional comments on the risk assessment after we conclude a more thorough review of the April 2016 revisions (received on October 28, 2016).	The inclusion of Oregon Cleanup Rules as ARARs was evaluated by USACE Office of Counsel for the Center of Expertise with specific consideration given to the determination of whether Oregon's identification of $1x10^{-6}$ constitutes inclusion as an ARAR. USACE determined that Oregon's established risk value does not constitute an ARAR, as it does not meet the ARARs threshold definition of being chemical, location, or action specific, per the NCP, 40 C.F.R. 300.5. However, the current risk assessment (RA) does identify all COCs based on exceeding $1x10^{-6}$. COCs were then further screened as part of the FS to identify risk drivers for the purpose of developing PRGs. The cleanup action then has a variety of technologies to address the upland risk (removal, capping, IC) for these risk drivers. Therefore, the RA is consistent with Oregon Law in regards to the use of $1x10^{-6}$ for determining which COPCs are COCs and in determining cleanup levels. TPH was not evaluated in this feasibility study and is consistent implementation of CERCLA and the definition of "hazardous substance" under Section 101(14) of CERCLA.
2	Contaminants of potential Concern (COPCs) / Contaminants of concern (COCs): The FS defines contaminants of concern as a subset of the larger list of contaminants of potential concern (COPCs) that present principal risks. The report specifies this definition for ecological risk as contaminants of potential ecological concern (CPECs) and contaminants of ecological concern (CECs). While this distinction is informative, the definition remains the same. Under this definition, other COCs not designated as risk drivers will not be assessed as part of the reviews that are conducted every five years once a CERCLA cleanup has begun (five-year reviews), and will not be included in the post-cleanup monitoring program (Section 1.3.1, Page 1-4). DEQ disagrees with this definition and limitation, and concludes the management decision to limit COCs is not consistent with CERCLA or ODEQ rules. COCs are defined as the comprehensive list of COPCs that exceed risk based criteria defined in the risk assessment. Since some COPCs drop out based on the comparison with risk criteria, the contaminants remaining at the conclusion of the risk assessment are then defined as COCs. There is no basis for shrinking the identified COC list to a shorter list of chemicals posing unacceptable risk, as was done in this FS. All COCs, as defined above, form the basis for a remedial action. The basis for action is defined on page 6-13 of the EPA's ROD guidance, which states in part "chemical-specific standards or other measures that define acceptable risk levels are exceeded and exposure to contaminants above these acceptable levels is predicted for the RME". For the upland risk assessment, this includes the comprehensive list in Tables 11-1 and 11-2 (Human Health) and for ecological risk Tables N-1 through N-5 of Appendix N (2012 RI) for the landfill AOPC, Tables N-11 through N-15 for the Sandblast Area AOPC, Tables N-21 through N-27 for the Pistol Range AOPC, and Tables N-43 and N-44 for all four AOPCs combined. Note that some COCs (e.g. TPH, butyltins, chlordane, heptachlor, lindane, dieldrin, endrins, endosulfans, phthalates, and methoxychlor) are designed as "bio" or "No SLV" in the tables, indicating no SLV was developed in the risk assessment. These COCs should also be evaluated in the feasibility study. The evaluation for mass wasting and soil erosion into the river OU is provided in Appendix O (Tables O.3-5 through O.3-11). The 2012 risk assessment is cited because contaminants above risk based criteria (or those without criteria) are identified without the overlay of risk management decisions limiting the COC list, as was done in the DRAFT Nov. 2015 Upland Baseline Risk Assessment. Disagreements with the Corps over the use of risk management decisions within the baseline risk assessment form the basis of DEQ's comments on the 2015 DRAFT RA, which have not been resolved. DEQ understands that while all COCs form the basis for action, not all COCs may form a basis for the final remedy selected in the FS. However, any remedy selected should be shown to be protective of this larger list of COCs. For the purpose of DEQ comments provided below, a COC is defined as any contaminant showing unacceptable risk in the 2012 risk assessment (and where SLVs were not developed), and not limited to only "risk drivers".	The tables cited in this comment refer to COPCs and CPECs identified in the Remedial Investigation. The RI initiated the process to identify COIs, COPCs, and CPECs. COIs were initially defined based on detection frequency and maximum detection above background concentrations (for inorganics only). These COIs were then screened during the RI in a screening level risk assessment that incorporated both EPA and Oregon DEQ screening guidance for human health and ecological risk. The results of this screening level risk assessment yielded a suite of COPCs and CPECs that were carried forward to the baseline risk assessments. In addition to the COPCs and CPECs identified in the RI, additional COPCs were included to account for the inclusion of the tribal fishing receptor prior to initiating the baseline risk assessment. The baseline risk assessments identified COCs and CECs based on whether contaminants had a HQ greater than 1 or cancer risk greater than $1x10^{-6}$. During the FS process, COCs and CECs with cancer risk factors above $1x10^{-4}$, the upper limit of EPA's Risk Management Range, were identified as risk drivers and associated RAOs and PRGs were set for those contaminants to formulate remedial alternatives. USACE still maintains the list of COCs and CECs, as determined during the RI process, which will be included in long-term monitoring if such monitoring is included in the final remedy selection. Therefore, USACE has not shortened the list of COCs and CECs. However, only the risk driver chemicals form the required basis for developing remedial alternatives. Figure 3.9 has been added to the Feasibility Study to illustrate the process from identification of COIs to formulating a list of COCs and CECs, including specific risk drivers.
3	Sandblast Area. Using Oregon acceptable risk criteria, the Sandblast AOPC should be evaluated for remediation. This includes the drum storage area. On page 3-17, the draft report states, "In regards to ecological risk, given the light industrial use of the area for the project, use of the Sandblast AOPC for functional wildlife habitat is unwarranted, and thus remediation for ecological risk in unwarranted." However, significant volumes of sandblast media have been delineated in the uplands, in both surface and subsurface soil. Sandblast waste contains the original sandblast media (e.g. green diamond, red diamond) which contained primarily metallic contaminants of concern, as well as COCs found in paints from stripping and re-painting operations, such as anti-fouling agents (e.g. organometallic chemicals) and lead based paints, in addition to other COCs present, including pesticides. The transformer release area, located within the sandblast area has been found to contain PCB Aroclor 1260 ranging up to 370 micrograms per kilogram (ug/kg), and significant concentrations of TPH. In addition to direct contact pathways to upland receptors, the mass of waste present	The inclusion of Oregon Cleanup Rules as ARARs was evaluated by USACE Office of Counsel for the Center of Expertise with specific consideration given to the determination of whether Oregon's identification of $1x10^{-6}$ constitutes inclusion as an ARAR. USACE determined that Oregon's established risk value does not constitute an ARAR, as it does not meet the ARARs threshold definition of being chemical, location, or action specific, per the NCP, 40 C.F.R. 300.5. The Sandblast AOPC will primarily be accessed by occupational receptors due to limited site access. Risk for

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	(estimated at 70 tons per year beginning in 1958) presents a potential on-going risk to the Columbia River. Sandblast material was characterized in 1994 and determined to be a Resource Conservation Recover Act (RCRA) hazardous waste for lead and sometimes for chromium based on leachability. During our October 20, 2016 site visit, green sandblast grit was found both at the surface of gravel areas and mixed within forest soil in the sand blast area. This is consistent with Figure 8-1 of URS 2002. This report found observable sandblast media in the portion of the Sandblast Area designated as Area 1 at depths of 2.5-3 feet below ground surface (bgs). It is important to note that the visual inspection of the occurrence of sandblast media extends beyond what is represented by the current sampling locations. Additionally, it is reported that a significant source of sandblast and paint-related waste could be located below the pavement and gravel currently surrounding the sandblast building. The remains of the burn pit present in the sandblast area AOPC was also noted during the site visit. It is unclear if this feature has been characterized for contaminants of concern. However, the burning of waste may have caused the generation of additional COCs, including dioxins and furans. In summary, contamination from the sandblast area extends into areas that clearly provide ecological habitat.	occupational receptors exposed to contamination in the Sandblast AOPC was found to be at acceptable levels of risk per CERCLA's risk management range of $1x10^{-4}$ to $1x10^{-6}$. Exposure to the tribal fishing receptor in the Sandblast AOPC was updated to account for the receptor to transit this portion of the site as part of fishing activities. A 4-hour exposure period, 7 days per week over a 70-year duration was applied. This additional exposure scenario did not result in any unacceptable risk to the tribal fishing receptor. There are no pathways from the Upland OU that are resulting in significant recontamination to the river. Stormwater is primarily controlled by catch basins with filter socks that are replaced twice annually as part of ongoing maintenance, thus keeping sandblast material and sediments from migrating to the river. The Contaminants of Interest identified during the RI in groundwater and seeps were VOCs and metals; however, they were subsequently not detected at concentrations greater than sediment SLVs in river sediment samples. These contaminants have also not been seen in biota at levels constituting risk. The RI states that based on analytical data, the burn pit itself does not appear to be a source of contamination. Soil samples collected from the burn pit in the Sandblast AOPC during the RI were evaluated as part of the baseline risk assessment. Based on the exposure scenarios for the occupational receptor and updated tribal fishing receptor, exposure to soil does not pose a risk to human health above CERCLA's risk management range. While ecological receptors will be present within the Sandblast AOPC, risk for those receptors is managed on a community or population basis, and risks from the Sandblast AOPC are not assumed to have deleterious impacts on community or populations levels of ecological receptors. Furthermore, this industrial area is not assumed to provide suitable wildlife habitat for ecological receptors due to its industrial use, and is thus being managed in accordance with industrial use purposes. Per CERLCA, risk is the basis for determining if remedial action is warranted. Visual indicators alone, in this case the visual presence of sandblast grit, does not trigger the need for remedial action. Contamination associated with sandblast grit was evaluated in the baseline risk assessments through incorporation of sandblast grit contaminant concentrations into the exposure point concentration.
4	Landfill As described in section 6.3.1.5, remedial alternative L5 includes removal and offsite disposal of all waste in the landfill. We believe complete removal of this waste is prudent, given the following: - The very high contaminant concentrations in the river were the result of the in-water dumping of electrical equipment, some of which contained PCB oil. - While test pitting did not indicate the presence of such equipment in the landfill, some of this equipment may have been taken to the landfill, even though test pits did not reveal them. - The landfill is adjacent to the river. - As noted in section 2.4.2 of the feasibility study, high groundwater may intercept waste. - If oil-filled electrical equipment were disposed of in the landfill, this equipment may have leaked, or may leak in the future. - Our ability to determine the presence or absence of PCB oil in the landfill based on soil sampling and groundwater monitoring is limited. - The feasibility study assumed that all waste removed for offsite disposal would have to be considered hazardous waste. This is a reasonable and conservative assumption for a feasibility study. However, if some of the material can be demonstrated to be nonhazardous, this would reduce that cost. The feasibility study states that at least some of the waste in the landfill will have to be removed to reduce the slope steepness along the river bank so that the bank is geotechnically stable. Measures will be needed to prevent debris from falling into the river during upland remediation, especially during proposed excavation of waste. Such measures could involve construction of a deck to cover the river near the excavation area, or other	USACE acknowledges Oregon DEQ's preference for implementation of alternative L5 in the Landfill AOPC and will take this into account when selecting the preferred remedy. USACE does not have reason to believe capacitors were disposed of in the Landfill AOPC. Historic records for the project were reviewed during the time of the RI and all capacitors that were documented for disposal were retrieved from the river. Should any buried debris or anomalies be found during potential future excavation, debris and adjacent soils will be removed to the extent that ensures cleanup goals are met. Excavated material from any portion of the Upland OU will be characterized prior to disposal to determine the appropriate disposal facility; ultimately, this will affect cost, but for feasibility study purposes USACE has made the conservative assumption that excavated material will need to be disposed of in a Subtitle C landfill. It is understood that materials must be prevented from entering the river as part of Upland OU remedial action. Examples of measures to prevent debris from falling into the river during upland remediation efforts have been added to the report, and it was noted that this is the reason for a cost premium/multiplier for the Landfill AOPC alternative.

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	alternatives. Whatever method is selected, this may involve fairly significant cost, yet it is not mentioned in the text of the feasibility study or in the cost estimate (Appendix 3). As noted in section 2.4.2, the landfill AOPC contains a variety of waste materials including those from pesticide and herbicide mixing and wash areas, sandblast media waste, PCB-containing electrical equipment (up to 50 ballasts), and mercury vapor lamps. Lead hot spots have been found. The conceptual site model fails to describe and account for the variability in the nature of landfilled waste areas. Section 2.4.8.1 states "discrete source areas have not been identified within the Landfill AOPC. Rather, the type and magnitude of contamination within the Landfill AOPC is variable, consistent with the variable waste management, storage, and disposal activities that occurred at the Landfill AOPC".	The procedures for managing materials are not included in the description of the remedy alternative, but will be specified in the remedial design/remedial action phase. This includes management of the variability in the types of landfill waste.
5	Human Health Risk Assessment. The November 2015 version of the risk assessment was included as Appendix B. However, this was replaced by the April 2016 revised risk assessment, which the Corps provided on October 28, 2016. Some of DEQ's issues with the feasibility study (such as including Oregon acceptable risk levels as ARARs) also apply to the risk assessment, as we have previously noted. Please note that we will need more time to review this document.	The incorrect version of the risk assessment was provided with the draft Feasibility Study. This has been corrected.
6	Upland feasibility study Scope: Considerations of Risk / Beneficial Use to Columbia River. The upland feasibility study focuses entirely on human health and terrestrial risk due to contact with upland soil. Upland sources are connected directly to the Columbia River through groundwater to surface water, overland transport, storm water pathways, and mass wasting (surface and subsurface soil). Without a risk evaluation and screening of these pathways, it is not possible to comprehensively evaluate if the actions proposed in the feasibility study are protective. Upland contaminants of potential concern (COPCs) identified for erodible or mass wasting pathways to the river for each area of potential concern (Table 9-6) are presented in URS 2012, and should be evaluated in this FS as COCs . Tables 9-1 through 9-5 of URS 2012 show groundwater COCs in relation to risk to the river. These tables should be added to the data summary tables in the FS. Although Table 2-1 of this FS summarizes some of the information for other COCs and pathways, media in all upland AOPCs should be evaluated for the need to evaluate removal, stabilization and source control to protect river receptors. All in-water COCs are also upland COCs (and vice versa), and should be evaluated to determine if an upland action is needed to adequately reduce risk in the river. For example, arsenic, chromium, mercury, nickel, zinc, DDX (DDT, DDD, &DDE), chlordane, dieldrin, lindane, phthalates, butyltins, endrin, endrin aldehyde, PAHs, TPH and total PCBs are some of the more prevalent tissue and sediment in-water COCs, and therefore upland sources should be evaluated accordingly. Most of these COCs were detected in upland surface and subsurface media, but were dropped in the risk management step given no risk based criteria were developed. For pesticides, dieldrin was detected in fish tissue up to 2.9 mg/kg, chlordane up to 5 mg/kg, and endrin up to 1.2 mg/kg although these were not retained as COCs for scoping the Upland FS. Remedial action objectives (RAOs) and preliminary remediation goals (PRGs) protective of the river should be developed, such that upland media can be identified and evaluated and added to Section 3, Risk Assessment Summary.	The groundwater to surface water pathway between the Upland and River OUs does not present a significant source of recontamination for the potential future remedy in the River OU. During groundwater and seep investigations conducted as part of the Remedial Investigations, metals and VOCs were the risk driver contaminants that exceeded the SLVs or reference area concentrations. These contaminants were not detected at corresponding concentrations that would cause risk for human health or the environment in the River OU; therefore, they are not considered COCs in the river. Furthermore, PCBs, which are a risk driver contaminant for the River OU, were either found at concentrations below the SLV or non-detect in groundwater and seeps from the Upland OU. This supports the CSM for the River OU that identifies the primary source of contamination coming from waste deposited directly into the river, as opposed to waste migration from upland areas. Additional text has been added to Section 2.4.7 of the feasibility study regarding this.
7	Upland Exposure Pathways. Remediation for ecological risk pathways should be evaluated regardless of the outcome of human health risk assessments, for protection of ecological current and future use. The larger list of ecological CPECs identified in the 2012 risk assessment, defined as CECs or COCs here, should be evaluated in the FS.	Human health and ecological health risks were evaluated separately. Based on the findings of the risk assessments, and taking into consideration current and future land use, ecological risks were addressed through development of remedial action alternatives in the feasibility study. For example, remedial action alternatives were developed for the Pistol Range AOPC because of unacceptable risk for the robin receptor, despite there being no unacceptable human health risk within that AOPC. CPECs were identified in the RI based on the results of the screening level risk assessment. The CECs were identified as a subset of the initial CPEC list based on the findings of the baseline ecological risk assessment. Risk Drivers are then identified from the CEC list, when taking into account risk management considerations. The full suite of CECs from the baseline risk assessment will continue to be monitored during long term monitoring.
SPECIFIC COMMENTS		
8	Page ES-4, RAOs. RAOs should not be limited to risk drivers. RAOs should be general (e.g., reduce risk to acceptable levels) rather than call out a specific chemical such as cPAHs.	RAOs and associated PRGs were only developed for risk driver chemicals given that those chemicals are identified as exceeding the upper limit of CERCLA's risk management range of $1x10^{-4}$ to $1x10^{-6}$ for cancer risk and an HQ of 1 for non-cancer risk. Additional text has been added to Section 3.4 of the report to explain the process of screening chemicals and identifying risk drivers. EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies (October 1988) under CERCLA states that "remedial action objectives aimed at protecting human health and the environment should specify: the contaminant(s) of concern,

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		exposure route(s) and receptor(s), and an acceptable contaminant level or range of levels for each exposure route (i.e., a preliminary remediation goal)". RAOs for the Upland OU were developed based on this guidance.
9	Page ES-5, Development of Remedial Alternatives. No justification is provided for why remedial action is not warranted at the Sandblast and Bulb Slope AOPCs.	Throughout Section 3, and specifically within Section 3.4 of the Draft Feasibility Study, a discussion is provided for why remedial action is not warranted for the Bulb Slope AOPC. Section 3.7 provides justification for why remedial action is not warranted for the Sandblast AOPC.
10	Page 2-14, Section 2.2.1.1, Landfill AOPC. All data and lines of evidence should be used to identify contaminants of concern (COCs) for residual sampling and monitoring. Without additional risk analysis, CPECs become final COCs. Past sampling showed significant concentrations of COCs other than PCBs, including antimony, dibenzofuran, B2HP (& other phthalates), 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, ethylbenzene, carbazole, m,p-xylenes, o-xylene, naphthalene, PAHs (total HPAH & LPAH), TPH, n-butylbenzene, n-propyl benzene, toluene, pesticides such as dieldrin, chlordane, heptachlor epoxide, MCPP, dichlorprop, DDD, DDE, and DDT, dinoseb in test pits within the landfill. Diesel (9,700 ppm) and residual range TPH (31,400 ppm) were also detected in soil, as well as in seep and surface water. The deeper samples seem relevant and applicable for the FS evaluation. Some of the highest concentrations were found at 10 ft, which could represent a risk to the river given the steep drop into the river of 30 to 35 feet (Section 2.4.1), and any product or groundwater pathways. As documented in Appendix G of URS 2012, test pit TP-01 at a depth of 10 feet had detections of PCBs of 2.25 ppm, copper at 1,620 ppm, and lead at 7,140 ppm. Since the test pit data were excluded from the FS, Table 2-5 incorrectly states that some COCs in the landfill were not detected in any samples. Furthermore, conclusions made using only shallow soil data do not account for deeper contamination that may come in contact with the river. The highest concentrations in river sediment for pesticides, PCBs, and TPH were found at location P113, down slope from the landfill. Clam tissue showed elevated levels of total PCBs, arsenic, lead, cadmium, nickel, chromium, DDT, chlordane, endrin, endrin aldehyde, endosulfan and PAHs. Since clam body burdens are most reflected by water exposure concentrations, groundwater to surface water pathways should be evaluated.	The slope cutback component of the Landfill AOPC remedial alternatives is conceptually designed to take out a large portion of the landfill that goes down 10ft and back approximately 30ft. If visual inspection shows additional excavation is needed, further excavation would be done to remove visible contamination. Pre-design sampling will be done with soil cores to confirm the full vertical extent of contamination and required excavation depth. Hot spot analysis was incorporated into the feasibility study, which identifies a majority of the hotspots near the river border. These locations will be removed regardless because of the slope cutback component. Deeper soil data was incorporated into the alternatives formulation. As indicated in Appendix G of the RI, data from Test Pit 1 and some other test pits were not used in the risk assessment or formulation of alternatives either due to poor data quality or because historical samples are no longer representative of current conditions. The groundwater to surface water pathway between the Upland and River OUs does not present a significant source of recontamination for the potential future remedy in the River OU. During groundwater and seep investigations conducted as part of the Remedial Investigations, metals and VOCs were the Contaminants of Interest that exceeded the SLVs or reference area concentrations. However, these contaminants were not detected at corresponding concentrations that would cause risk for human health or the environment in the River OU. Furthermore, PCBs, which are the primary contaminant of concern for the River OU, were either found at concentrations below the SLV or non-detect in groundwater and seeps from the Upland OU. The 0-10 ft depth interval was evaluated for the occupational receptor, and no levels of unacceptable risk were identified.
11	Page 2-18, stormwater filter socks. The report refers to "replacement on a periodic basis." Please identify the frequency of inspection and replacement since 2002 and planned frequency of inspection and replacement in the future.	Additional information regarding the replacement and maintenance of the filter socks has been added to the Feasibility Study in Section 2.4.7 based on maintenance reports obtained from the operating project. Filter socks are replaced twice annually in the spring and fall.
12	Page 2-24, Section 2.2.2.1.1.6, ecological risk screening. This section should discuss the nature and extent of sandblast media waste.	A complete description of the Sandblast AOPC, including the site characterization work done to date, is provided in Section 2.2.1.2.
13	Page 2-25, Section 2.2.2.1.1.11. It would be helpful to clarify that the reason there is not a significant risk to humans at the bulb slope area is because it is highly unlikely there will be upland exposure to the high concentrations.	Concur. The following statement was added to Section 2.2.2.1.1.11, "This is due to the unlikelihood of human exposure on the Bulb Slope."
14	Page 2-25, Section 2.2.2.2, Recommendations from the RI Report. These must include pathways that impact the beneficial uses of the Columbia River and not just refinement of risk to terrestrial receptors.	The information provided in Section 2.2.2.2 is summarizing the recommendations provided in the Remedial Investigation Report, which was finalized in 2012. The RAOs and PRGs presented in the Upland OU Feasibility Study address risk to receptors in the upland. A separate set of RAOs and PRGs are developed for the River OU to address those receptors associated specifically with the river, including recreational and subsistence fishers. Engineering solutions are incorporated into all the alternatives for the landfill to ensure mass wasting is not transporting contamination from the Upland OU to the River OU. Potential erosion from the Bulb Slope AOPC will be addressed in the River OU feasibility study. As discussed previously, groundwater and seeps from the Upland OU are not significant sources of contamination to the River OU.

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15	Page 2-26, Section 2.3. See general comment on heterogeneity of landfilled wastes and implications for statistical comparisons to background based on discrete limited data. This is also noted on page 2-32, Section 2.4.7.1: "the type and magnitude of contamination in the Landfill AOPC is variable, consistent with the variable waste management, storage, and disposal activities that occurred at the area".	USACE agrees that waste in the Landfill AOPC is inherently heterogeneous. Sampling will be conducted during pre-design investigations to fully define both the lateral and vertical extent for the footprint of the selected remedy.
16	Page 2-27. The second paragraph on this page indicates that only the top 1 foot of waste could get into the river as a result of mass wasting. What is the basis for this conclusion?	USACE did not intend for the Feasibility Study to include only the top 1 ft of soil as subject to potential mass wasting. The text in section 2.3.1 has been clarified to indicate these samples are within the lateral footprint of soil subject to mass wasting. The geotechnical stability memo (Appendix 2) states: "Future mass wasting should be anticipated, including shallow landslides that fail to depths of 3 to 10 feet." All landfill alternatives (except for Alternative L1) were designed with the landfill cutback in mind to address contamination at depth and stabilize the slope to reduce the likelihood of landfill material falling into the river.
17	Page 2-29, Section 2.3.7. The comparison of site concentrations with background concentrations is a difficult process, and should be discussed with DEQ. Background concentrations are presented as upper prediction levels. Site concentrations as upper confidence limits (UCLs) on the mean should not be compared with upper prediction limit (UPL) values.	UCLs were not compared to UPLs for purposes of developing this Feasibility Study. UCLs were used exclusively for setting PRGs and formulating alternatives. UPLs are referenced and incorporated into the Feasibility Study because this was the primary statistic developed for the Remedial Investigation.
18	Page 2-29, Section 2.4.1. The report refers to the average river elevation as 74 feet. Please also report the maximum river elevation in comparison to the elevation of the bottom of waste in the landfill.	The normal operating range for the Bonneville pool is between 71.5 feet msl elevation and 76.6 feet msl as measured at the dam. Pool elevations behind Bonneville Dam remain relatively constant given the heavy regulation from the spillway. The maximum river elevation is not particularly useful given that the associated frequency is relatively low and contaminant migration from extremely rare events likely has negligible contributions to overall risk and is subsequently not a driver for formulation of remedial alternatives.
19	Page 2-30, Section 2.4.2. The text states "during wet portions of the year, groundwater elevation can potentially rise enough to encounter waste materials in a small portion of the landfill AOPC. Have the waste characteristics within this area been identified / mapped? Discuss characterization of the landfill in terms of test pit observation (to 15 ft), subsurface soil concentrations (to 10 ft), and groundwater concentrations that may come in contact with the river.	Deeper soil samples are limited to 18 locations within two areas: the gully test pit and the mercury vapor-lamp test pit. As such, additional characterization will be conducted during pre-design to fully delineate the vertical and lateral extent of contamination in the Landfill AOPC. Per the Remedial Investigation, there were limited exceedances of the SLV for contamination at depth in the Landfill AOPC (see Tables 5-1a through 5-1c, 5-2a through 5-2d, 5-3a and 5-3b, and 6-2a of the RI). While some of these contaminants were also present in groundwater and seeps associated with the Landfill AOPC, few of these contaminants, with the exception of PCBs, are present in the River OU at level unacceptable to human health and the environment. Given the CSM for the River OU, it is believed that the source of these PCBs is not from the Upland OU, but rather from waste that was disposed of directly in the river.
20	Page 2-31, Sandblast Area AOPC. The volume and distribution of sandblast waste and grit should be described as well as estimates of water concentrations generated from leaching. The adequacy and results of the current monitoring well program to assess this pathway should be discussed. COCs identified by comparing groundwater, and soil (erosion and mass wasting pathways) should be identified using aquatic criteria.	While a leaching characterization of the sandblast grit was not conducted as part of the feasibility study evaluation, based on groundwater data and the risk assessment results it can be assumed that the sandblast grit is not having detrimental impacts to the groundwater to such a degree that would result in unacceptable risk to human health or the environment. As stated in response to other comments, groundwater and seeps are not believed to have unacceptable impacts to the River OU. Because the groundwater pathway to human receptors in the upland is incomplete, groundwater remediation is not warranted for the site.
21	Page 2-32, Release Mechanism. Direct contact of groundwater with buried debris and contaminated soil should also be listed, as well as preferential pathways, such as pipes and other drainage structures.	Groundwater contact with buried debris and contaminated soil is already identified in section 2.4.6. Because the catch basins and outfall have been cleaned and are regularly maintained with filter socks, they do not represent a significant transport pathway. No revisions were made to the text for this comment.
22	Page 2-33, Sandblast Area AOPC Nature & Extent of Contamination. Much of the discussion in the feasibility study and risk assessments focus on risk associated with a focused list of risk drivers to upland terrestrial receptors, but not riverine ecological receptors. Of particular concern is the steeply sloped, wooded hill just above the equipment lay down area. Visible sandblast grit was found in soil along this hillside, and in addition to direct contact, this area could be a major source to catch basin #1, the lay down area, adjacent riverbank, and surface water of the Columbia River. COCs identified in the ecological risk assessment included antimony, chromium, lead, nickel, DEHP, and total PAHs. Additionally, testing of sandblast grit waste shows detections of a wide range of pesticides, PAHs (total LPAH & HPAH), TPH, phthalates, butyltins, dibenzofuran, carbazole, VOCs, and PCBs (e.g. Aroclor 1260) (URS, 2002). For example, B2EHP has been characterized at 43.5 ppm in catch basin #1 and 260 ppm sandblast soils. Recent in-river sediment sampling (2011) detected the highest concentrations of bis(2-ethylhexyl) phthalate (B2EHP) and di-n buytlphthalate, and mercury as well as total PCBs, chlordane, dieldrin, endrin and other metals.	Risk to riverine ecological receptors is captured in the River OU baseline risk assessment and feasibility study. HPAHs and Chlordane are the only CECs that are identified in both the baseline risk assessments for the River and Upland OUs. Also, the visible presence of sandblast grit is not considered an indication of risk. Rather, soil sample results form the basis for risk evaluation. Furthermore, filter socks in catch basins provide an effective migration barrier against sandblast grit. As such, it is not expected that other CECs from the Upland OU will cause adverse ecological effects to receptors in the River OU.

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23	Page 2-33, Section 2.4.7.2: Sandblast Area AOPC, Former Drum Storage Area. Sandblast grit was stored in this area, the extent of which has not been fully delineated. Significant concentrations of chromium, PAHs, mono-di and tri-butyl tins, and phthalates were detected in this area. For example, B2EHP was detected up to 18,500 ppb. Groundwater from this area may discharge to the south via the pistol range area. Groundwater results should therefore be discussed in the context of data evaluations on the south side of the island (e.g. pistol range).	Please see response to previous comments regarding sandblast grit and groundwater as a source of contamination to the River OU.
24	Page 2-33, Section 2.4.7.2, Sandblast Area Source Areas. The basis for excluding the former burn pit, septic tank drain field area, two Hazardous Materials Storage Areas, the transformer disassembly area and the drum storage area as primary sources of contamination is not clear.	The exposure scenario for the Sandblast AOPC has been updated in Section 3.2.2.2 of the feasibility study to account for tribal fishing platform receptors to transit across the Sandblast AOPC (represented by a 4 hour per day exposure time) when accessing Bradford Island. While the general area of the Sandblast AOPC will remain an active area for work associated with the Bonneville Dam operating project, assumptions have been incorporated to quantify risk to tribal fishers. The occupational scenario remains unchanged. For both the updated tribal fishing receptor and the occupation exposure scenario, risk does not exceed $1x10^{-4}$, the high end of the CERCLA risk management range of $1x10^{-4}$ and $1x10^{-6}$.
25	Page 2-34, Section 2.4.7.2. This section discusses a monitoring well location CB-2; this appears to be an error, as CB-2 is presumably a catch basin.	The text has been corrected to read, "...erodible soils at the ground surface immediately upslope of catch basin CB-2."
26	Page 2-35, Section 2.4.7.4. Observations of bulb slope debris were noted in sediment sampling rounds. Although this area may not represent a direct contact risk for upland receptors to soil, mass wasting should be evaluated for risk to the river. Risk to the beneficial use of the river should be discussed in the context of the COC data.	USACE will conduct a geotechnical analysis of the Bulb Slope AOPC to determine if it represents a potential for mass wasting to the River OU. Mass wasting has been included in the CSM as a potential pathway from the Bulb Slope AOPC to the River OU. Management measures to control for this contaminant transport pathway will be presented in the River OU FS.
27	Page 2-36, Section 2.4.8.1, Landfill AOPC. Insoluble / non-volatile contaminants can be moved to the river via oil and product co-solvency at deep depths where the landfill waste meets bedrock. This may not be mitigated by soil where landfilled waste is present at the surface (as the text indicates), and may not be entirely captured by the shallow seep sampling that has been completed, as groundwater entering bottom sediments have not been identified or sampled. One type of transformer found along the river near the landfill contained Inerteen and mineral phase liquid DNAPL as thermal insulating fluids (coupling capacitors, lightning arrestors, and light ballasts also found). Inerteen is a dense, non-aqueous phase liquid (DNAPL), which consists of approximately 60 percent PCB Aroclor 1260 and 40 percent trichlorobenzene (TCB). Minor amounts of monochlorobenzene and dichlorobenzene are also associated with Inerteen (Westinghouse Electric, EPA Superfund Site, 1991). Was the presence of DNAPL from these different equipment sources, as well as colloid and co-solvent effects considered as pathways to the river for all depths of the landfill? Based on the above information, it may not always be the case that PCBs and PAHs "absorb strongly to soil and are not readily soluble or volatile". Sandblast waste was also disposed in the landfill, indicating leaching potential should be evaluated. DNAPL and groundwater pathways may also be spatially heterogeneous, making them difficult to locate.	USACE does not have evidence that transformers were disposed of in the landfill. No NAPL was encountered in landfill soil samples or groundwater samples during the remedial investigation. The only known disposal of transformers was directly to the river. As such, USACE does not believe there to be evidence supporting the hypothesis that NAPL product is contained within the Landfill AOPC.
28	Page 2-31, Section 2.4.3, last sentence. Although the Sandblast Area AOPC has become revegetated, DEQ is not convinced the soils are no longer considered erodible. During our October 2016 site visit, we observed rainwater draining across the area.	As stated in the Remedial Investigation, an area northeast of the former sandblast building was observed to have been recently disturbed and was identified as erodible, whereby contaminated surface soil could be transported to the river via stormwater drainage and surface water runoff. However, more recently, this area has become revegetated and the soils are no longer considered erodible to any significant degree. Additionally, beginning in 2001, USACE cleaned the sediment from the stormwater system associated with this and three other catch basins and replaced the filter fabric socks that line each catch basin. These filter fabric socks are replaced twice annually. During the October 2016 site visit, the culvert was plugged with debris, which is not a typical condition. Operations staff at the project were subsequently informed of the debris and the culvert was cleaned. As such, there is no suspected contamination transporting from the upland to the river via stormwater and overland transport pathways.
29	Page 2-39, Section 2.4.8.2, Sandblast Area AOPC. It is unclear if engineering controls implemented have brought off-site migration of contaminants (soluble & particulate sandblast grit) down to acceptable risk levels as stated here.	Beginning in 2001, USCAE cleaned the sediment from the stormwater system associated with this and three other catch basins and replaced the filter fabric socks that line each catch basin. These filter fabric socks are replaced twice annually. As such, there is no suspected contamination transporting from the upland to the river via stormwater and overland transport pathways.

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30	Page 2-39, Pistol Range AOPC. The source of the leaching to groundwater pathway identified in this section should be discussed, as the text indicates "the data from the two groundwater samples collected suggest that metals have leached to groundwater to a limited extent." The discussion should include potential up gradient sources such as the sandblast and former drum storage areas.	Section 2.4.7 has been added to discuss release mechanisms and transport media, including groundwater. Groundwater in the Pistol Range AOPC did not have concentrations of contaminants that exceeded screening levels. As such, groundwater in the Pistol Range AOPC does not pose a risk to human health or the environment. Contaminant migration in groundwater from other AOPCs is inconsequential given that pathways to human health or ecological receptors, as well as the River OU, are not considered to pose a risk.
31	Page 3-1, Section 3, Risk Assessment Findings. The risk assessment findings presented "only includes the estimated risk for terrestrial plants, soil invertebrates, and wildlife receptors exposed to contaminants exposed primarily through direct contact of incidental ingestion of soil, prey, and water that collects in the Upland OU". PRGs should be established for upland soil for the protection of groundwater and storm water pathways to the river for protection of beneficial uses in the Columbia River.	Risk to riverine ecological receptors is captured in the River OU baseline risk assessment and feasibility study. HPAHs and Chlordane are the only CECs that are identified in both the baseline risk assessments for the River and Upland OUs. Also, as noted previously, there are no pathways from the Upland OU that are resulting in significant recontamination to the river. As such, it is not expected that other CECs from the Upland OU will cause adverse ecological effects to receptors in the River OU via groundwater or stormwater.
32	Page 3-4, Section 3.1.6, Risk Drivers for Ecological Receptors. This section should identify all COCs posing unacceptable risk (see general comment). Sediment and surface water criteria also need to be evaluated. In-water COCs should be identified as upland COCs on this basis (e.g., PCBs). Show that any selection of a reduced list of risk drivers should be protective of all chemicals with a hazard quotient greater than 1 (both CPECs and CECs). Both terrestrial and aquatic pathways risk drivers should be included. This larger list forms the basis for any confirmation sampling after any remedial actions are implemented, and should be included in the residual risk assessment. For terrestrial exposure pathways in the sandblast area, the full list of COCs should be considered, including pesticides, total LPAHs, TPH, B2EHP, dibenzofuran and antimony based on the 2012 risk assessment. Cis-1,2-dichloroethene was identified as an in-water COCs, in addition to dieldrin, chlordane and phthalates. Upland sources of these COCs should be identified and evaluated, particularly since many of these were detected, but not evaluated using risk based criteria. The landfill AOPC should be evaluated for chlordane and dieldrin, particularly given the recent detections in fish tissue. In addition, PCBs, antimony, MCPP, dichloroprop, B2EHP, and butylbenzyl phthalate, TPH, barium, iron manganese, zinc, arsenic, tributyltin, pentachlorophenol, 1,2,4-trimethylbenze, isopropyl benzene, n-propylbenzene, di-n-octyl phthalate, 2-methylnapthalene, acenaphthene and phenanthrene were identified as in-water COCs from the risk assessment. It is unclear why no risk drivers were identified for the four AOPCs combined given the widely distributed waste disposal practices, magnitude of detection and distribution in upland media by COCs, including lead and chromium (terrestrial receptors). Other COCs more widely distributed include B2EHP, antimony, mercury, zinc, nickel, TPH, PAHs and PCBs. Additionally, the AOPC combined risk to receptors such as the higher trophic level mammal and bird, represented by the mink and kestrel, should be discussed in terms of the uncertainty in the area use factors. For example, in the evaluation of risk to higher trophic level mammals and birds exposed to the risk driver chemicals, if primary use and exposure to the island is assumed (an area use closer to 1), risk to nickel, lead and chromium and chlordane is identified, resulting in LOAEL HQ's greater than 1. This range is important, since receptors such as bald eagles and many other bird species occur as both migratory and nesting and wintering residents of the Bonneville Dam area.	Please see the response to ODEQ's general comment 2 regarding COPCs and COCs. As stated in response to the previous comment, risk to riverine ecological receptors is captured in the River OU baseline risk assessment and feasibility study. HPAHs and Chlordane are the only CECs that are identified in both the baseline risk assessments for the River and Upland OUs. Also, as noted previously, there are no pathways from the Upland OU that are resulting in significant recontamination to the river. As such, it is not expected that other CECs from the Upland OU will cause adverse ecological effects to receptors in the River OU via groundwater or stormwater. Per the Baseline Human Health and Ecological Risk Assessments, no additional COCs or CECs were elucidated through examination of risk resulting from exposure to all four AOPCs combined. Thus, risk can be managed for each individual AOPC.
33	Page 3-5, Section 3.2, second to last paragraph, infant exposure. Infant exposure should not be limited to tribal populations; it also applies to long-term occupational exposure (but not short-term excavation or construction exposure).	The infant receptor is not standard for risk assessments under CERCLA but was added during the baseline risk assessment at the request of Oregon DEQ. The infant receptor was evaluated as a component of the tribal fishing platform receptor, which is the most sensitive receptor relative to the occupations receptors. Application of the infant receptor to the fishing platform user provides a conservative estimate of risk that is encompassing of infant receptors associated with the occupational worker.
34	Page 3-6, second paragraph, evaluation of COCs. In general, areas where chemical concentrations result in unacceptable risk should be evaluated in the feasibility study.	Cancer and non-cancer risk was calculated for arsenic for the appropriate receptors. As stated in the feasibility study, an evaluation of total, background, and site-related incremental risks was performed. Because of elevated natural background concentrations of arsenic present in the region of Bradford Island, site-related arsenic contributions to risk were found to be at acceptable levels. This application of assessing background and incremental contributions of site related risk aligns with US EPA guidance, Role of Background in CERCLA Cleanup Program (2002) and Guidance for Comparing Background and Chemical Concentrations in Soil at CERCLA Sites (2002).
35	Page 3-6, Section 3.2.1.1, second paragraph, arsenic risk. DEQ does not consider site-related risk from arsenic to be within acceptable levels. As stated in comments on the HHRA, if concentrations of inorganic chemicals are above background levels, risks from exposure to those chemicals need to be	Application of background concentrations is consistent with CERCLA process. USACE acknowledges that this is at odds with portions of ODEQ's guidance on background. However, the feasibility study is following CERCLA guidance and criteria.

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	evaluated. DEQ rules specify that cleanup to concentrations below background levels will not be required. However, DEQ definitions of acceptable risk are not applied to incremental risks above background levels.	
36	Page 3-7, Section 3.2.1.2. See comments below on Table 3-4. Based on state definitions of acceptable risk, DEQ would identify more unacceptable risks in this AOPC.	Per CERCLA guidance for evaluating cancer risk, common mode of action was applied to evaluate cumulative risk. USACE acknowledges that this is at odds with ODEQ guidance. Risk Based Threshold Concentrations and subsequent PRGs for cPAHs took into account risk levels at $1x10^{-6}$, rather than $1x10^{-5}$. However, the text in Section 3.2 will be revised to omit the additional application of $1x10^{-5}$ for cPAHs.
37	Page 3-10, Section 3.2.3, risk drivers. Because there are not inordinate numbers of chemicals, there is no need to focus solely on those determined to be risk drivers. PRGs should be developed for all chemicals showing unacceptable risk.	The inclusion of Oregon Cleanup Rules as ARARs was evaluated by USACE Office of Counsel for the Center of Expertise with specific consideration given to the determination of whether Oregon's identification of $1x10^{-6}$ constitutes inclusion as an ARAR. USACE determined that Oregon's established risk value does not constitute an ARAR, as it does not meet the ARARs threshold definition of being chemical, location, or action specific, per the NCP, 40 C.F.R. 300.5. Please see response to previous comments regarding the screening process to go from COCs/CECs to Risk Drivers. Figure 3.9 has also been added to the feasibility study to illustrate the screening process.
38	Page 3-12, Section 3.3.2, p. 3-12, last sentence to top of 3-13, cumulative risk. For cancer, DEQ does not need to have a common mode of action to evaluate cumulative risk. Also, DEQ considers cPAHs a single substance, so the 1×10^{-6} acceptable cancer risk levels applies to the total cPAH risk.	Text has been added to accurately capture ODEQ's guidance on cumulative risk. cPAHs were identified as a risk driver chemical and PRGs were set at a cancer risk level corresponding to $1x10^{-6}$.
39	Page 4-1, Section 4.1. Remedial action objectives should include both aquatic and terrestrial ecological risk, including groundwater, storm water and overland run-off. The conclusions stated "in regards to ecological risk, given the light industrial use of the area for the project, use of the Sandblast AOPC for function wildlife habitat is unwarranted, and thus remediation for ecological risk is unwarranted". This conclusion is made despite the management objectives to maintain Bradford Island for wildlife use, the fact that portions of the sandblast area is terrestrial habitat and not used for industrial activity, and without any evaluation of risk of the waste in this area to ecological receptors in the Columbia River. Due to complete exposure pathways to both terrestrial and aquatic receptors, DEQ believes remediation of ecological risk is warranted.	Risk to riverine ecological receptors is captured in the River OU baseline risk assessment and feasibility study. HPAHs and Chlordane are the only CECs that are identified in both the baseline risk assessments for the River and Upland OUs. Also, as noted previously, there are no pathways from the Upland OU that are resulting in significant recontamination to the river. As such, it is not expected that other CECs from the Upland OU will cause adverse ecological effects to receptors in the River OU via groundwater or stormwater. While portions of Bradford Island will be maintained for wildlife use, the area associated with the Sandblast AOPC will remain an active light industrial area associated with the Bonneville Dam operating project. As such, the Sandblast AOPC is not intended to provide suitable wildlife habitat. The acreage of the Sandblast AOPC and associated ecological risk is not believed to have adverse impacts to population or community level receptors, thus remediation for ecological risk is not warranted.
40	Page 4-2, Section 4.1, Remedial Action Objectives. The RAOs must also contain objectives of protecting exposure in the Columbia River (groundwater, surface water, storm water, sediment). The RAOs should not specifically list a narrow set of COCs. This should be general, and COCs are identified by the risk assessments. Remedial actions must be shown to be protective of all COCs (defined in general comment).	EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA states that remedial action objectives aimed at protecting human health and the environment should specify: the contaminant(s) of concern, exposure route(s) and receptor(s), and an acceptable contaminant level or range of levels for each exposure route (i.e., a preliminary remediation goal). RAOs were established based on this guidance. The absence of RAOs for the exposure routes mentioned indicates that there was no unacceptable risk associated with those exposure routes.
41	Page 4-4, Section 4.3.3. The definitions of background are inconsistent with both DEQ rules (OAR 340-122-0040) and CERCLA. DEQ rules and CERCLA take different approaches to consideration of background concentrations. DEQ rule defines background as only those occurring naturally, and states that chemicals that fall into this definition may be screened out of the risk assessment. This DEQ definition and process would not pertain to organic manmade contaminants referred to in the feasibility study. However, the risk assessment and FS cites CERCLA guidance and process, and on that basis all COCs, both inorganic and organic chemicals, should be carried forward in the risk assessment. Definition and application of background in the risk assessment remains an unresolved comment on the 2015 Upland Risk Assessment, as the document oversteps by omitting both inorganic and organic chemicals from the risk assessment using comparison to background (natural and anthropogenic). The FS should summarize this complete list of COCs. Background concentrations should be evaluated only as it pertains to avoiding setting cleanup criteria below site specific background.	Application of background concentrations is consistent with CERCLA process. USACE acknowledges that this is at odds with portions of ODEQ's guidance on background. However, the feasibility study is following CERCLA guidance and criteria.
42	Page 4-6, Section 4.3.6, Cumulative Risk. Since this evaluation only looked at a smaller set of risk drivers, the cumulative risk from all COCs must be assessed to ensure any remedy is protective of baseline risk.	Cumulative risk was qualitatively evaluated to address all COCs in section 3.5. Language is not specific to only risk driver chemicals in section 3.5. The same conservative methodology was applied to all contaminants evaluated as part of the baseline risk assessment. Given that much of the contamination is co-located, and

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		risk drivers cover a relatively large footprint within each AOPC, cumulative risk is still adequately addressed both in the evaluation of risk and in the formulation of remedial alternatives.
43	Section 6.2.2.2, landfill cover soil. The report states that "the 95% UCL of the top 3 feet (for the Landfill AOPC) or 1.5 feet (for the Pistol Range AOPC) of material must be lower than the PRG for each COC or CEC risk driver." If portions of landfill waste were to remain, standard practice for such legacy landfills is to apply 3 feet of clean soil, not soil that is merely below risk threshold values. The amount of imported clean fill needed would depend on a review of existing data, and new data if needed, to properly evaluate the thickness and chemical characteristics of the existing cover soil.	Agree. The intent is to backfill and/or cap with clean material. Specific contaminants for the backfill were identified for purposes of this FS to ensure the backfill material would achieve the PRGs for the site. Text has been added to Section 6.2.2.1 of the Feasibility Study to indicate a more exhaustive list of contaminants and thresholds for acceptable backfill material will be specified in design.
44	Page 7-14, Section 7.4. DEQ believes the full COCs and CECs list needs to be considered in remedial alternatives for the Bradford Island uplands, and not just the "risk driver" COCs identified in the RAOs (Section 4) that include cPAHs for human health and chromium, copper, lead, mercury, nickel and total high molecular weight PAHs (HPAHs). Although Section 7.4 identifies a few others (arsenic and Total PCBs for the landfill; arsenic, antimony, total PCBs and DEHP) for the sandblast area), the full list of COCs derived from the larger COPC list is needed.	The primary basis for identifying these risk driver contaminants was based on application of CERCLA's risk management range with the high end of $1x10^{-4}$. Generally, carcinogenic COCs that had a risk greater than $1x10^{-4}$ were identified as risk drivers. COCs/CECs with a non-cancer hazard greater than 1 were also identified as risk drivers. RAOs and PRGs were subsequently established for these risk driver contaminants. The full list of COCs and CECs will be taken into consideration when developing long term monitoring strategies.
45	Table 2-1, Occurrence and Status of T&E and Sensitive Species. The statement that the probability of occurrence for some organisms is "very unlikely" is questionable, particularly in the statements regarding use by salmon and lamprey in the Columbia River. Additionally, deer tracks were witnessed during our October 20, 2016 site visit.	Salmon and lamprey are not resident species to Bradford Island, thus their occurrence near Bradford Island is likely to be limited. While deer may be present at the site, it is not suspected that they are part of the T&E population of Columbia White Tailed Deer.
46	Table 2-5, Landfill AOPC Summaries. Since contact with the river through mass wasting or groundwater discharge appear to be the most significant pathways to the river, an evaluation of a comprehensive dataset of deeper soil beyond the limited monitoring well subset in the FS is warranted. For example, soil data for test pit locations on the island can be found in Appendix G of the URS 2012. The conclusion for the landfill is that the "primary mechanism for off-site transport of contaminants from the landfill AOPC appears to be leaching of contaminants from buried debris and / or contaminated soil to groundwater, and discharge of contaminants in the groundwater zone to the river via seeps. There is also a low potential for metals, pesticides, PCBs, PAHs, and SVOCs in soil to migrate to the river via mass wasting of soil". DEQ concludes mass wasting of soil has a high potential to impact the river. This supports evaluating deeper landfill soil for removal / stabilization. Table 3-2 should show the hazard quotients for all CPECs from the 2012 risk assessment for terrestrial and aquatic risk (groundwater, seep, erosion, mass wasting) to upland media (e.g. PCBs, pesticides, butyltins, phthalates, Total PAHs, Total LPAHs) for the evaluation of cumulative risk. Soil plant and invertebrate HQs are underestimated due to the use of 5 x multiplier on maximum acceptable values for these species.	Agree. A full vertical and lateral characterization of the Landfill AOPC will be conducted as part of pre-design investigations. This will confirm the extent of the remedial footprint.
47	Table 3-4, summary of COCs: - Identification of risk drivers is not necessary for this site. All chemicals of concern should be summarized in this table. This table can serve as a summary of COCs. - Excess cancer risks for outdoor maintenance workers (5×10^{-5}) and construction workers (5×10^{-6}) for cPAHs in the Landfill AOPC exceed the Oregon acceptable risk ARAR of 1×10^{-6}. - Naphthalene should be added as a COC for the Landfill AOPC with a maximum RME excess cancer risk of 9×10^{-6}. - cPAHs are identified as risk drivers to Native American users of fishing platforms based on an excess cancer risk of 2.5×10^{-6}, although the rationale indicates cPAHs risks fall within EPA's acceptable risk range. The text is likely switched with the rationale for total PCBs. - Excess cancer risks for outdoor maintenance workers (arsenic at 3×10^{-6}, in addition to the identified cPAHs at 1×10^{-5}) and construction workers (cPAHs at 2×10^{-6}) in the Landfill AOPC exceeded the Oregon acceptable risk ARAR of 1×10^{-6}. These receptors should be included in the table. - Calculated excess cancer risks should be presented to only one significant digit.	The inclusion of Oregon Cleanup Rules as ARARs was evaluated by USACE Office of Counsel for the Center of Expertise with specific consideration given to the determination of whether Oregon's identification of $1x10^{-6}$ constitutes inclusion as an ARAR. USACE determined that Oregon's established risk value does not constitute an ARAR, as it does not meet the ARARs threshold definition of being chemical, location, or action specific, per the NCP, 40 C.F.R. 300.5. Text in Table 3-4 has been corrected in relation to the tribal fishing platform receptor and cPAHs.
48	Table 3-9. Soil RBTCs are presented for outdoor maintenance workers and construction workers in the Landfill AOPC, even though there is not a RAO to address worker exposure. RBTCs are presented for the Sandblast AOPC even though remediation of this area was not evaluated. Worker exposure in both areas should be considered because calculated excess cancer risks exceed acceptable risk levels in Oregon.	The inclusion of Oregon Cleanup Rules as ARARs was evaluated by USACE Office of Counsel for the Center of Expertise with specific consideration given to the determination of whether Oregon's identification of $1x10^{-6}$ constitutes inclusion as an ARAR. USACE has determined that Oregon's established risk value does not constitute an ARAR, as it does not meet the ARARs threshold definition of being chemical, location, or action specific, per the NCP, 40 C.F.R. 300.5.
49	Figure 3-3. The Pistol Range AOPC includes locations with concentrations exceeding the ecological RBC for lead of 78 mg/kg. The AOPC should encompass locations PFR48 (915 mg/kg and 835 mg/kg) and PFR50 (817 mg/kg and 1,110 mg/kg), as shown on Figure 6-5.	USACE acknowledges that the boundaries of the Pistol Range AOPC have been depicted differently amongst various documents. Regardless, the samples mentioned as part of this comment are addressed in the development of remedial alternatives for the Pistol Range AOPC.

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50	Figures 6-6 to 6-8, Section 7 figures, and revised Figures 3-1 and 3-5. These figures are listed in the table of contents, but are not included in the file of figures.	These figures were erroneously listed in the table of contents. The document has been revised accordingly.
51	Appendix 3, Cost Estimate. Geosynthetics not mentioned in text. There are numerous references to use of a bentonite geocomposite clay liner and a 40-mil high density polyethylene (HDPE) liner. These are not discussed in the report, although the report does refer to use of geotextile as a separation layer or warning barrier. Based on our discussion at the September 27, 2016 TAG meeting, mention of the bentonite and HDPE items in this appendix was incorrect. For reference, these items are mentioned at the following pdf pages: 48, 160, 198, 225, 358, 384, 429, 434, 435, 492	Correct. Bentonite liners or HDPE liners were not the intent. Rather, a brightly colored geotextile warning layer is what was intended. Revisions to the cost Appendix will be made.
52	Appendix 3, Cost Estimate. Sand blast area alternatives. Pdf pages 324 through 549 describe sand blast area alternatives 2 through 5. These are not discussed in section 6.3 of the report. As noted above, however, these alternatives may need to be considered for the sandblast area because DEQ's carcinogenic risk threshold is an ARAR, contrary to what the report says.	This information was erroneously included in the Cost Estimate. The document has been revised accordingly.
53	Appendix 3, Cost Estimate. Reference to Figure 6-5. Pdf page 355 states that Sandblast Area Alternative 2 is illustrated in Figure 6-5. However, this figure pertains instead to Pistol Range Alternatives 2 and 3.	This information was erroneously included in the Cost Estimate. The document has been revised accordingly.
54	Appendix 3, Cost Estimate. Reference to Figure 6-6. Pdf page 448 (Sandblast Area Alternative 4 – Capping and Institutional Controls) states that "Alternative SA4 includes the small asphalt cap in Alternative SA2, but includes additional capping over all the same footprint as alternative SA3 (blue and red in Figure 6-6) to further reduce exposure point concentrations." However, the report does not include a Figure 6-6, and the text of the report does not refer to this alternative.	This information was erroneously included in the Cost Estimate. The document has been revised accordingly.
55	Appendix 3, Cost Estimate. Reference to Figure 6-7. Pdf page 506 (Sandblast Area Alternative 5 – Complete Excavation and Backfill) states: "Alternative SA5 includes deep excavation (assumed to be 0 - 10 feet bgs) and backfill to remove most or all of the potentially contaminated material (Figure 6-7)." However, the main portion of the feasibility study does not mention this alternative, and Figure 6-7 is not included.	This information was erroneously included in the Cost Estimate. The document has been revised accordingly.